

Introduction to Quantum Stochastic Calculus and Applications

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Many avenues exist for extending probability theory to a non-Kolmogoroffian one – one of these is the one following from the Quantum theory. A system of filtrations can be constructed in the Fock space by an increasing family of non-commutative $*$ -algebras, often containing commuting subfiltrations, most noteworthy amongst them are the classical ones coming from the Brownian motion and Poisson process. Non-commutative diffusions can be constructed in Fock space starting with a stochastic differential equation, driven by three fundamental non-commuting martingales.